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Production or aromatic carotenoids in gram negative bacteria

Description of Technology: This invention is in the field of microbiology. More specifically, this invention pertains to nucleic acid fragments encoding enzymes useful for production of aromatic carotenoid compounds.

Patent Listing:

1. **US Patent No. 7,132,257**, Issued November 7, 2006, "Production or aromatic carotenoids in gram negative bacteria"
   http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F7132257

Market Potential: Carotenoids are pigments that are ubiquitous throughout nature and synthesized by all photosynthetic organisms, and in some heterotrophic growing bacteria and fungi. Carotenoids provide color for flowers, vegetables, insects, fish, and birds. Colors range from yellow to red with variations of brown and purple. As precursors of vitamin A, carotenoids are fundamental components in our diet and they play an important role in human health. Industrial uses of carotenoids include pharmaceuticals, food supplements, animal feed additives, and colorants in cosmetics, to mention a few. Because animals are unable to synthesize carotenoids de novo, they must obtain them by dietary means. Thus, manipulation of carotenoid production and composition in bacteria can provide new or improved sources for carotenoids.

The problem to be solved is to express a functional carotene desaturase (crtU) gene for the production of aryl-carotenoids in a gram-negative production host at commercially-significant concentrations. Applicants have solved the stated problem by isolating the crtU gene from Brevibacterium linens and expressing an optimized version of this gene in an Escherichia coli strain engineered to produce high levels of carotenoids.

Benefits:

- Expresses a functional carotene desaturase (crtU) gene
- Produces high levels of carotenoids

Applications:

- Plant biology

Contact: Ken Anderson
Director, Entrepreneurial & Small Business Support, Delaware Economic Development Office (DEDO)
Carvel State Building, 820 French Street, Wilmington, DE, 19801
Phone: (302) 577-8496, Fax: (302) 577-8499, Email: Kenneth.R.Anderson@state.de.us